

IN THE CLAIMS:

B<sup>11</sup> 1. (Currently Amended) A discharging surface treatment method for generating a discharge between an electrode and a treatment target so that a ~~hard-coat~~ coating film is formed on the surface of the treatment target by the discharging energy,

~~wherein a powder that is formed by a simple substance or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous family metal powder or non-ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of a plurality of metals, and this is compressed and molded, and then burned at a temperature at which the ferrous family or non-ferrous metal powder forming a powder mixture, comprising as one component: (a) a ferrous-family metal powder or a non-ferrous-family metal powder, wherein each of said metal powders can be formed of one or plural metals; and, as a second component, (b) one or a plurality of metal carbides, wherein the elemental metal of the carbide or carbides belongs to the IVa, Va or VIa families in the Periodic Table;~~

the non-ferrous-family metal powder having the same composition as the treatment target;

heating the powder mixture to a temperature at which said component (a) starts to elute melt to form an electrode serving as a discharge processing electrode, and

electrical conditions at ~~the~~ a time when ~~the~~ a base member of the treatment target is directly subjected to a discharging surface treatment, and ~~the~~ electrical conditions at ~~the~~ a time when a ~~hard-coat~~ coating film that has been formed on the base member is subjected to a discharging surface treatment, are altered according to the characteristics of the treatment target material.

2. (Currently Amended) A discharging surface treatment method for generating a discharge between an electrode and a treatment target so that a ~~hard-coat~~ coating film is formed on the surface of the treatment target by the discharging energy,

~~wherein a powder that is formed by a simple substance or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous family metal powder or non-ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of a plurality of metals, and this is compressed and molded, and then burned at a temperature at which the ferrous family or non-ferrous metal powder forming a powder mixture, comprising as one component: (a) a ferrous-family metal powder or a non-ferrous-family metal powder, wherein each of said metal powders can be formed of one or plural metals; and, as a second component, (b) one or a plurality of metal carbides, wherein the elemental metal of the carbide or carbides belongs to the IVa, Va or VIa families in the Periodic Table;~~

the non-ferrous-family metal powder having the same composition as the treatment target;

heating the powder mixture to a temperature at which said component (a) starts to elute melt to form an electrode serving as a discharge processing electrode, and

electrical conditions, at ~~the~~ a time when a ~~hard-coat~~ coating film that has been formed is subjected to a discharging surface treatment, are altered at least once according to the characteristics of the treatment target material.

3. (Currently Amended) A discharging surface treatment method for generating a discharge between an electrode and a treatment target so that a ~~hard-coat~~ coating film is formed on the surface of the treatment target by the discharging energy,

~~wherein a powder that is formed by a simple substance or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous family metal powder or non-ferrous metal powder having the same composition as the~~

~~treatment target as a simple substance or a combination of a plurality of metals, and this is compressed and molded, and then burned at a temperature at which the ferrous family or non-ferrous metal powder~~ forming a powder mixture, comprising as one component: (a) a ferrous-family metal powder or a non-ferrous-family metal powder, wherein each of said metal powders can be formed of one or plural metals; and, as a second component, (b) one or a plurality of metal carbides, wherein the elemental metal of the carbide or carbides belongs to the IVa, Va or VIa families in the Periodic Table;

the non-ferrous-family metal powder having the same composition as the treatment target;

heating the powder mixture to a temperature at which said component (a) starts to elute melt to form an electrode serving as a discharge processing electrode, and

electrical conditions at ~~the~~ a time when ~~the~~ a base member of the treatment target is directly subjected to a discharging surface treatment, and ~~the~~ electrical conditions at ~~the~~ a time when a ~~hard-coat~~ coating film that has been formed is subjected to a discharging surface treatment, are altered according to the characteristics of the treatment target material, and while

the electrical conditions, at the time when the ~~hard-coat~~ coating film that has been formed on the base member is subjected to a discharging surface treatment, are altered at least once according to the characteristics of the treatment target material.

4. (Previously Amended) The discharging surface treatment method according to claim 1, wherein an inert gas is interpolated between the discharge processing electrode and the treatment target.

5. (Previously Amended) The discharging surface treatment method according to claim 2, wherein an inert gas is interpolated between the discharge processing electrode and the treatment target.

6. (Previously Amended) The discharging surface treatment method according to claim 3, wherein an inert gas is interpolated between the discharge processing electrode and the treatment target.

7. (Currently Amended) The discharging surface treatment method according to claim 1, wherein the discharge processing electrode is allowed to scan the treatment target so that the ~~hard coat~~ coating film is formed on the surface of the treatment target.

8. (Currently Amended) The discharging surface treatment method according to claim 2, wherein the discharge processing electrode is allowed to scan the treatment target so that the ~~hard coat~~ coating film is formed on the surface of the treatment target.

9. (Currently Amended) The discharging surface treatment method according to claim 3, wherein the discharge processing electrode is allowed to scan the treatment target so that the ~~hard coat~~ coating film is formed on the surface of the treatment target.

10. (Currently Amended) A discharging surface treatment device for generating a discharge between an electrode and a treatment target so that a ~~hard-coat~~ coating film is formed on the surface of the treatment target by the discharging energy,

~~wherein a powder that is formed by a simple substance or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous family metal powder or non-ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of a plurality of metals, and this is compressed and molded, and then burned at a temperature at which the ferrous family or non-ferrous metal powder~~ forming a powder mixture, comprising as one component: (a) a ferrous-family metal powder or a non-ferrous-family metal powder, wherein each of said metal powders can be formed of one or plural metals; and, as a second component, (b) one or a plurality of

metal carbides, wherein the elemental metal of the carbide or carbides belongs to the IVa, Va or VIa families in the Periodic Table;

the non-ferrous-family metal powder having the same composition as the treatment target;

heating the powder mixture to a temperature at which said component (a) starts to elute melt to form an electrode serving as a discharge processing electrode, and

said discharging surface treatment device is provided with a switching unit which alters the electrical conditions at the a time when the a base member of the treatment target is directly subjected to a discharging surface treatment, and the electrical conditions at the a time when a ~~hard-coat~~ coating film that has been formed on the base member is subjected to a discharging surface treatment, according to the characteristics of the treatment target material.

11. (Currently Amended) A discharging surface treatment device for generating a discharge between an electrode and a treatment target so that a ~~hard-coat~~ coating film is formed on the surface of the treatment target by the discharging energy,

~~wherein a powder that is formed by a simple substance or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous-family metal powder or non ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of a plurality of metals, and this is compressed and molded, and then burned at a temperature at which the ferrous family or non-ferrous metal powder forming a powder mixture, comprising as one component: (a) a ferrous-family metal powder or a non-ferrous-family metal powder, wherein each of said metal powders can be formed of one or plural metals; and, as a second component, (b) one or a plurality of metal carbides, wherein the elemental metal of the carbide or carbides belongs to the IVa, Va or VIa families in the Periodic Table;~~

the non-ferrous-family metal powder having the same composition as the treatment target;

heating the powder mixture to a temperature at which said component (a) starts to elute melt to form an electrode serving as a discharge processing electrode, and

said discharging surface treatment device is provided with a switching unit which alters the electrical conditions, at the a time when a ~~hard-coat~~ coating film that has been formed is subjected to a discharging surface treatment, at least once according to the characteristics of the treatment target material.

12. (Currently Amended) A discharging surface treatment device for generating a discharge between an electrode and a treatment target so that a ~~hard-coat~~ coating film is formed on the surface of the treatment target by the discharging energy,

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~~wherein a powder that is formed by a simple substance or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous-family metal powder or non-ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of a plurality of metals, and this is compressed and molded, and then burned at a temperature at which the ferrous family or non-ferrous metal powder forming a powder mixture, comprising as one component: (a) a ferrous-family metal powder or a non-ferrous-family metal powder, wherein each of said metal powders can be formed of one or plural metals; and, as a second component, (b) one or a plurality of metal carbides, wherein the elemental metal of the carbide or carbides belongs to the IVa, Va or VIa families in the Periodic Table;~~

the non-ferrous-family metal powder having the same composition as the treatment target;

heating the powder mixture to a temperature at which said component (a) starts to elute melt to form an electrode serving as a discharge processing electrode, and

said discharging surface treatment device is provided with a first switching unit and a second switching unit, wherein said first switching unit ~~which~~ alters the electrical conditions at ~~the~~ a time when ~~the~~ a base member of the treatment target is directly subjected to a discharging surface treatment, and ~~the~~ which alters electrical conditions at ~~the~~ a time when a ~~hard-coat coating~~ film that has been formed is subjected to a discharging surface treatment, according to the characteristics of the treatment target material, and a

wherein the second switching unit ~~which~~ alters ~~the~~ electrical conditions, at ~~the~~ a time when the ~~hard-coat coating~~ film that has been formed on the base member is subjected to a discharging surface treatment, at least once according to the characteristics of the treatment target material.

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13. (Previously Amended) The discharging surface treatment device according to claim 10, wherein an inert-gas supplying unit is installed so as to interpolate an inert gas between the discharge processing electrode and the treatment target.

14. (Previously Amended) The discharging surface treatment device according to claim 11, wherein an inert-gas supplying unit is installed so as to interpolate an inert gas between the discharge processing electrode and the treatment target.

15. (Previously Amended) The discharging surface treatment device according to claim 12, wherein an inert-gas supplying unit is installed so as to interpolate an inert gas between the discharge processing electrode and the treatment target.

16. (Currently Amended) The discharging surface treatment device according to claim 10, wherein an X-axis driving device, a Y-axis driving device and a Z-axis driving device, which relatively shift the discharge processing electrode and the treatment target in the X-direction, Y-direction and Z-direction, are installed so that the X-axis driving device, the Y-axis driving device and the Z-axis driving device allow the discharge processing electrode to scan the treatment target to form the ~~hard-coat~~ coating film on the surface of the treatment target.

B 11  
17. (Currently Amended) The discharging surface treatment device according to claim 11, wherein an X-axis driving device, a Y-axis driving device and a Z-axis driving device, which relatively shift the discharge processing electrode and the treatment target in the X-direction, Y-direction and Z-direction, are installed so that the X-axis driving device, the Y-axis driving device and the Z-axis driving device allow the sintered electrode to scan the treatment target to form the ~~hard-coat~~ coating film on the surface of the treatment target.

18. (Currently Amended) The discharging surface treatment device according to claim 12, wherein an X-axis driving device, a Y-axis driving device and a Z-axis driving device, which relatively shift the discharge processing electrode and the treatment target in the X-direction, Y-direction and Z-direction, are installed so that the X-axis driving device, the Y-axis driving device and the Z-axis driving device allow the discharge processing electrode to scan the treatment target to form the ~~hard-coat~~ coating film on the surface of the treatment target.

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